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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,664	09/29/2003	David Haase	EMC-03-100	2361

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EXAMINER	
FARROKH, HASHEM	
ART UNIT	**PAPER NUMBER**
2187	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/673,664	HAASE ET AL.	
	Examiner	Art Unit	
	Hashem Farrokh	2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,6-9,13-16,20 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6-9,13-16,20 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

This Office Action is response to communication(s) filed on 7/20/07. Claims 1, 8, and 15 have been amended; claims 3-5,10-12, and 17-19 have been canceled; no new claims have been added.

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/20/07 has been entered.

INFORMATION CONCERNING CLAIMS:

Claim Rejections - 35 USC § 102

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1-2, 6-9, 13-16, and 20-21 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,898,681 B2 to Young.

3. In regard to claim 1, Young teaches:

"In a data storage environment having a first volume of data denominated as the source being stored on a data storage system **(column 4, lines 11-15; element 6 in Fig. 1)**, and a second volume of data denominated as the clone, which has data content that is a copy of the data content of the source being stored on the data storage system **(column 4, lines 11-15; element 8 in Fig. 1)**, a method operable on a computer

system for protecting the clone's data content during a restoration of the source," **(e.g., see column 1, lines 61-64; column 7, lines 30-38; element 4 in Fig. 1).** *For example the master store or volume represents the first volume and shadow store or volume represents the clone volume recited in the claim. The shadow store contains the point in time copy of master data, which is used for controlling, or managing data during the restoration the master or the source. When data is overwritten, a new point in time copy is created and the previous point time is protected (e.g., not overwritten).*

"the method comprising the steps of:"

"restoring the source by copying data content from the clone to overwrite the data content of the source while allowing host reads and writes to the source during the restoring step **(e.g., see column 10, lines 11-20; Fig. 6c)**, said copying being determined by a clone delta map used to track extents of the clone that are different between the clone and the source **(e.g., see column 10, lines 27-32),** and a protected restore map, used to track extents of the source that are modified during the restoring step, when an indication is set in the clone delta map and not set in the protected restore map;" **(e.g., see column 10, lines 24-26; Fig. 6a).** *Young teaches that during the recovery or restoration if the new data is to be written to a block in the master store or the source, the corresponding bit in the bitmap in shadow store or clone is set to one.*

"preserving the data content of clone by not allowing it to be overwritten by host writes during the restoring step;" **(e.g., see column 1, lines 61-64; column 20, lines 4-7).** *For example whether to overwrite or protect the point in time copy is user's selectable.*

"recording information that indicates the source affected by a host write in the protected restore map;" **(e.g., see column 10, line 26).** *The shadow bitmap represents the protected restore map. A "1" in the shadow bitmap indicates that its corresponding extent in the master store modified or over written.*

"setting the protected restore map as the delta clone map after the restoring step is completed." **(e.g., see column 10, lines 7-44; Fig. 6c).** *For example the shadow bitmap at the completion of recovery or restoration represents the delta clone map. A "one" in the shadow bitmap indicates extent that is different between the master and shadow store.*

4. In regard to claims 2, 9, and 16 Young teaches:

"wherein the source and the clone are each represented by respective first and second logical units." **(column 2, lines 35-40; column 4, lines 11-15).** *For example Young teaches that that a plurality of volumes are grouped together as a single logical device (e.g., source logical unit). The point in time copy of logical device is stored in shadow storage, which is in separate volumes, or logical device, which represents the clone logical unit recited in the claim.*

5. In regard to claims 6, 13 and 20 Young teaches:

"wherein the clone delta map is used to copy only extents that are different between the clone and its source during the restoration step." **(e.g., see column 10, lines 50-53; column 14, lines 26-31; Fig. 5a).** *For example setting of a bit in the bit map (e.g., a "logic 1") indicates that its corresponding data block in the shadow store is different from*

the one in the master store. The data blocks that have their corresponding bits in the bit map set will be copied to the master store during the restoration or recovery.

6. In regard to claims 7, 14 and 21 Young teaches:

"wherein the protected restore map is coordinated with the clone delta map for processing of write data to the source." **(e.g., see column 6, lines 66-67; column 7, lines 1-43; Fig. 5a-5e).** *For example the shadow bit map coordinated with the copy bit map for efficient of processing of write data to the master store.*

7. In regard to claim 8, Young teaches:

A system **(column 22, lines 24-26)** for protecting data content during restoration of data from a second volume of data to a first volume of data," **(e.g., see column 1, lines 61-64; column 7, lines 30-38; element 4 in Fig. 1).**

"the system comprising:"

"a data storage system having a first volume of data denominated as the source being stored on a data storage system **(column 4, lines 11-15; element 6 in Fig. 1)**, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system;" **(e.g., see column 4, lines 11-15; element 8 in Fig. 1).**

"computer-executable program logic, provided from a computer readable medium, configured for causing a computer-executed the steps of:" **(e.g., see column 25, lines 1-31; column 27, lines 38-46).**

"restoring the source by copying data content from the clone to overwrite the data content of the source **(e.g., see column 10, lines 11-20; Fig. 6c)** while allowing host

reads and writes to the source during the restoring step **(e.g., see column 7, lines 18-38; column 8, lines 56-61)**, said copying being determined by a clone delta map, used to track extents of the clone that are different between the clone and the source" **(e.g., see column 11, lines 55-62)**, and a protected restore map, used to track extents of the source that are modified during the restoring step, when an indication is set in the clone delta map and not set in the protected restore map;" **(e.g., see column 10, lines 24-26; Fig. 6a).** *Young teaches that during the recovery or restoration if the new data is to be written to a block in the master store or the source, the corresponding bit in the bitmap in shadow store or clone is set to one.*

"preserving the data content of clone by not allowing it to be overwritten by host writes during the restoring step." **(e.g., see column 1, lines 61-64; column 20, lines 4-7).**

"recording information that indicates the source affected by a host write in the protected restore map;" **(e.g., see column 10, line 26).** *The shadow bitmap represents the protected restore map. A "1" in the shadow bitmap indicates that its corresponding extent in the master store modified or over written.*

"setting the protected restore map as the delta clone map after the restoring step is completed." **(e.g., see column 10, lines 7-44; Fig. 6c).**

8. In regard to claim 15, Young teaches:

A program product **(e.g., column 4, lines 17-19)** for use in a data storage environment and being for protecting data content during restoration of data from a second volume of data to a first volume of data," **(e.g., see column 1, lines 61-64; column 7, lines 30-38; element 4 in Fig. 1).**

"wherein the data storage environment includes:"

"a data storage system having a first volume of data denominated as the source being stored on a data storage system **(column 4, lines 11-15; element 6 in Fig. 1)**, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system;" **(e.g., see column 4, lines 11-15; element 8 in Fig. 1).**

"the program product includes computer-executable logic contained on a computer-readable medium and which is configured for causing a computer to execute the steps of:" **(e.g., see column 25, lines 1-31; column 27, lines 38-46).**

"restoring the source by copying data content from the clone to overwrite the data content of the source **(e.g., see column 10, lines 11-20; Fig. 6c)**, while allowing host reads and writes to the source during the restoring step **(e.g., see column 7, lines 18-38; column 8, lines 56-61)**, said copying being determined by a clone delta map used to track extents of the clone that are different between the clone and the source, and a protected restore map, used to track extents of the source that are modified during the restoring step, when an indication is set in the clone delta map and not set in the protected restore map;" **(e.g., see column 10, lines 24-26; Fig. 6a).** *Young teaches that during the recovery or restoration if the new data is to be written to a block in the master store or the source, the corresponding bit in the bitmap in shadow store or clone is set to one.*

"preserving the data content of clone by not allowing it to be overwritten by host writes during the restoring step." **(e.g., see column 1, lines 61-64; column 20, lines 4-7).**

"recording information that indicates the source affected by a host write in the protected restore map;" **(e.g., see column 10, line 26).** *The shadow bitmap represents the protected restore map. A "1" in the shadow bitmap indicates that its corresponding extent in the master store modified or over written.*

"setting the protected restore map as the delta clone map after the restoring step is completed." **(e.g., see column 10, lines 7-44; Fig. 6c).**

Response to Applicant's Remarks

The Applicant has amended the independent claims 1, 8, and 15 and added a new limitation. However, as shown above Young teaches this new limitation.

Conclusion

Any inquiry concerning this communication should be directed to Hashem Farrokh whose telephone number is (571) 272-4193. The examiner can normally be reached Monday-Friday from ***8:00 AM to 5:00 PM.***

If attempt to reach the above noted Examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Donald A Sparks, can be reached on (571) 272-4201.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information about PAIR system, see http://pair-direct.uspto.gov. Should you have questions on

access to the Private PAIR system, contact the Electronic Business Center (EBS) at 866-217-9197 (toll-free).

HF

2007-08-04

Brian R. Peugh
Primary Examiner